

Linguatula Serrata Shifting Immune Response to Allergic Reaction with Destroy of Lymph Nodes

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INTRODUCTION

Linguatuliiasis is a rare zoonotic parasitic disease resulted from invasion of the body by parasites of Linguatula, also known as tongue worms. The most common reported species involved Linguatula serrata that is family Linguatulidae, order Porocephalida, phylum Pentastomida and it is commonly classified between annelids and arthropods. The evolutionary affinities of this unusual group of organisms have continued to confound biologists because of morphological similarities to both annelids and arthropods and suggestive phylogenetic relationships to Crustacea in the subclass Branchiura [1-4]. Linguatula serrata commonly resides within the nasal passages of canines and felines and occasionally humans. The life cycle of linguatulids involves two hosts. Development of larva occurs in an intermediate host, which begins by ingesting the eggs present in sputum, feces, or body cavity of definitive hosts [5-7]. The adult female of the parasite is tongue-shaped and has a length between 100-130 mm and its width is about 10 mm, whereas its male has a length of 20 mm and its width is 3-4 mm. Female worms produce several million eggs with the size of 90-70µm. The embryo develops in the egg in the presence of water or plant humidity. If the eggs are swallowed by a suitable intermediate host such as cattle, goat, sheep, rabbit, mouse or man, it will be hatched in alimentary canal; thus the larva penetrates the intestine wall and migrates to mesenteric lymph nodes or other organs. Parasite's nymphal stages develop in various organs, particularly mesenteric and mediastinal lymph nodes of these animals [8-10]. Human infection with Linguatulaserrata has been reported from different parts of the world including tropical regions of North and South America, Europe, Asia, Africa and Australia. Linguatula serrata infection in

animal intermediate host as main source of infection in public health should be considered as an important field of study. Humans can be infected by both adult stages, resulting in nasopharyngeal linguatulosis or halzoun syndrome. Halzoun syndrome is often characterized by inflammation of the upper respiratory tract, swelling of the sub-maxillary and cervical lymph nodes and occasionally abscess formation in the eyes or ears [1-13]. Cytokines secreted by activated CD4+ Th2 type T cells by Dendritic cells, play a major role in allergic reaction and other effectors cells, such as eosinophils, basophils, mast cells, myofibroblasts, epithelial cells, smooth muscle cells and endothelial cells that these play an important role in symptoms of allergic reactions [14-16]. The inflammation seen in allergy is associated with recruitment and activation of inflammatory cells. Activated eosinophils, basophils and mast cells play a critical role in the development of inflammation in allergy [17-19]. Eosinophils preferentially accumulate at sites of allergic inflammation and are believed to play important roles in the pathophysiology of allergy. Basophils and mast cells secreted factors from them have main role in unwanted symptoms in allergy reactions [20-22].

Hypothesis: When Antigen enters to the body, Dendritic Cells capture Antigen and are activated then migrate to Lymph node till there, process and present Antigen to T Cells for activation of Adoptive Immune response. Therefore Lymph node is a important and strategic location for initiation and activation of immune response. Each antigen enters to the body, which is captured by resident Dendritic Cells and traveled to local lymph node of that tissue. Mesenteric lymph nodes are main and strategic lymph node bowel and gastrointestinal system that is main site for confirmation, growth and development of nymph of Linguatula serreata. Growth of nymph in

lymph node lead to destroy and deletion of lymph node tissue that at least encapsulated necrosis tissue lymph node with blood penetration remain. So the main site of immune response is destroyed [3, 14, 20].

Because lymph nodes was destroyed, interaction between T and DC isn't done therefore not only Th1 isn't activated to continue type 1 immune response but also Th2 isn't activated to secret cytokines for type 2 immune response. Here B cells aren't activated too, so IgE isn't produced. When the main location of interaction Dendritic Cells with T Cells for initiation of Adoptive immune response is destroyed, the main immune response isn't formed and therefore alternative and compensation systems for verifying of pathogen are initiated. With block of Adoptive immune response, the Innate immune response (that was activated firstly) would be powerful but couldn't delete some pathogens so active other systems to help itself. In this time, additionally of all immunological factors, other cells for fight again pathogen infiltrated to site of pathogen that three types Cells eosinophil, basophile and mast cell are important. Eosinophil could be an antigen presenting cell and could have main role for activation of other inflammatory cells. These three cells, again undeleted pathogen are activated and release inflammatory component and Cytokines, especially allergic cytokines (type 2). These factors lead to release of allergic mediators and initiation symptoms of type 1 allergic reactions without IgE and symptoms of inactivated adoptive immune response would be meaningful and unwanted response are expanded that is similar type 1 allergic reactions but without IgE that is mediated with cytokines and mediators of these three cells in local of reaction. Therefore activated products of infiltrated cells for example; MBP from eosinophil, histamine, leukotrienes, protease, etc. from Basophile and mast cell lead to type 1 hypersensitive reactions without IgE. This reaction appears with inflammation, weal, flear and swelling in reaction site. These symptoms maybe lead to Inflammatory Bowel Disease (IBD) or diarrhea and melena, cacheksia and other problems.

Heightened public awareness of the danger of raw food and education of humans on different aspects of the epidemiology of the parasite. Linguatulosis poses veterinary and public health importance in the world. Because of the veterinary and human medical importance of linguatulosis, further investigations in the effect of this parasite in function of immune system and allergic response, especially food allergy and bowel inflammation are recommended.

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